

Wireless & The Future

2011 Spring 9-1-1 Technology Forum

MSP Training Academy

April 20, 2011

Agenda

- Upcoming Technical Conference Call:
 - Concept
 - Admin Details
- Wireless Overview
- Audience-Suggested Topics for Technical Call
- Contact: pw9571@att.com



Once Upon A Time...

Do you remember:

- Party lines?
- Rotary-dial telephones?
- The novelty of an “extension phone”?
- Operator-connected calls?
- Separate numbers for police, medical, and fire?
- The first time you heard of a “cellular phone”?



A Brief Timeline

- 1946: Mobile Telephone Service (MTS) begins
- 1947: Bell Labs invents the “cellular” concept
- 1957: The first “mobile” (sort of) phone
- 1960: Sweden begins first automated mobile telephone service
- 1964: Improved Mobile Telephone Service (IMTS) begins
- 1971: AT&T submits plan for cellular service to FCC
- 1982: FCC approves Advanced Mobile Phone Service (AMPS)
- 1983: First US commercial cellular call
- 1990: Digital AMPS begins
- 1992: US cellular subscribers exceed 10 million
- 1998: Digital One Rate plans eliminates home/roam distinction
- 1999: First “full internet” access via cellular in Japan
- 2000-2001: Cingular and AT&T Wireless make GSM technology decision
- 2003: EDGE (“Enhanced Data rates for GSM Evolution”) data networks launched



Present Day

The GSM / 3GPP Family of Technologies



Unmatched International Roaming Capabilities

AT&T has:

- Voice roaming in 220 countries
- Wireless data roaming in 200 countries

© 2013 AT&T Intellectual Property. All rights reserved. AT&T, the AT&T logo and all other marks contained herein are trademarks of AT&T Intellectual Property and/or AT&T affiliated companies. All other marks contained herein are the property of their respective owners. Information contained herein is not an offer, commitment, representation or warranty by AT&T and is subject to change. Mention of a specific company or entity is not an endorsement by AT&T.



Present Day

The GSM / 3GPP Family of Technologies

Standards-based wireless data evolution



- Increasing speeds
- Backwards Compatibility
- Worldwide Acceptance

imagine

create

deliver



The BIG Picture

The AT&T Network

Global Reach and Consistency

- Multi-protocol Label Switching (MPLS)-based services* available to **182** countries over **3,700+** nodes
- **38** Internet data centers across the globe
- Wired Ethernet in **50** countries
- Ethernet access in **44** countries and over **1,600** access points around the world
- OPT-E-WANSM VPLS in **38** countries
- **886,411** fiber route miles
- **337,388** wavelength miles of 40 Gbps
- Remote access over **196,000** points in **157** countries
- **Over 188,000** WiFi Hotspots in **86** countries and dial-up available in **157** countries



Simplified map: not all nodes/links/routes shown

* MPLS technology enables high-quality delivery to multiple services over a single IP Network Infrastructure.

The AT&T network carries more than 23.7 Petabytes of Data Traffic on an Average Business Day

© 2011 AT&T Intellectual Property. All rights reserved. AT&T, the AT&T logo and all other marks contained herein are trademarks of AT&T Intellectual Property and/or AT&T affiliated companies. All other marks contained herein are the property of their respective owners. Information contained herein is not an offer, commitment, representation or warranty by AT&T and is subject to change. Mention of a specific company or entity is not an endorsement by AT&T.



imagine

create

deliver

Explosive Data Growth

Video streaming pushing data growth



- Mobile data bandwidth usage worldwide rose 73 percent during the second half of 2010
- Video streaming is the fastest growing application, accounting for 37% of mobile bandwidth

Source: Allot Communications, Feb. 2011

imagine
create
deliver



Explosive Data Growth

An Insatiable Appetite for Data

- 8000% Growth in Mobile Traffic Data Over 4 Years



imagine
create

deliver

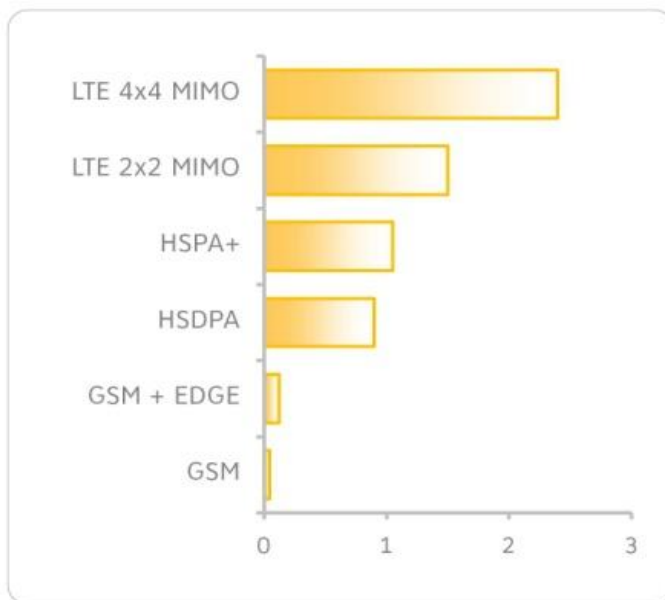


You Want Change?

Accelerate Network Efficiencies

Efficiency of Wireless Technologies
Spectral Efficiency (bits/Hz per site)

LTE inherently a more efficient technology



Source: AT&T

- LTE more efficient than HSPA*
- Improvements in architecture and signaling reduce round-trip latency*
- LTE can co-exist with earlier 3GPP radio technologies, even in adjacent channels*

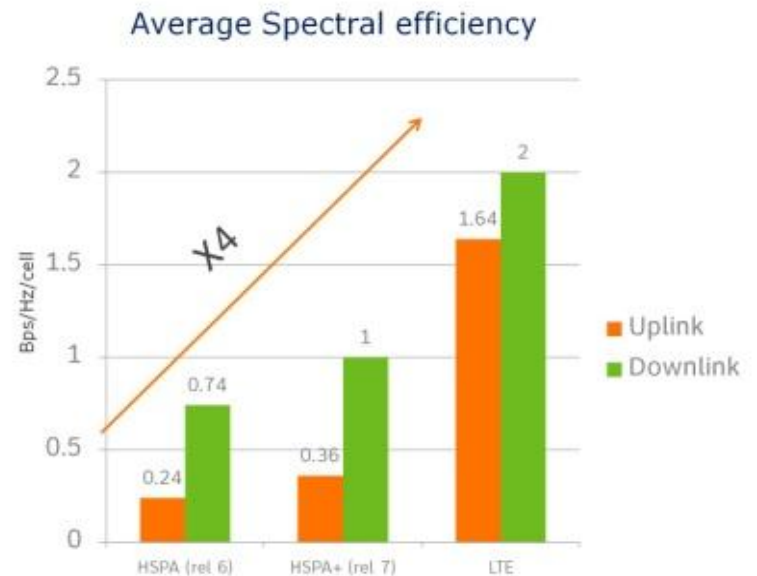
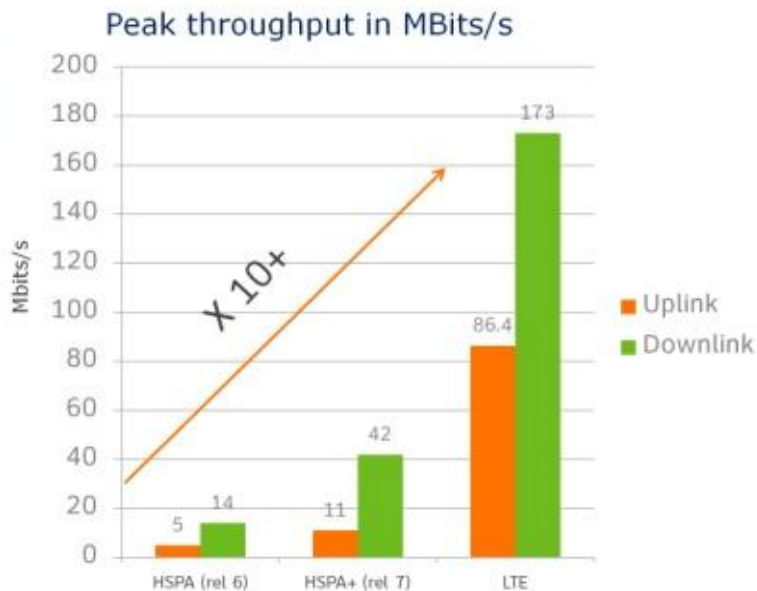
*3GPP

© 2011 AT&T Intellectual Property. All rights reserved. AT&T, the AT&T logo and all other marks contained herein are trademarks of AT&T Intellectual Property and/or AT&T affiliated companies. All other marks contained herein are the property of their respective owners. Information contained herein is not an offer, commitment, representation or warranty by AT&T and is subject to change. Mention of a specific company or entity is not an endorsement by AT&T.



LTE Changes Everything

Compelling LTE Performance



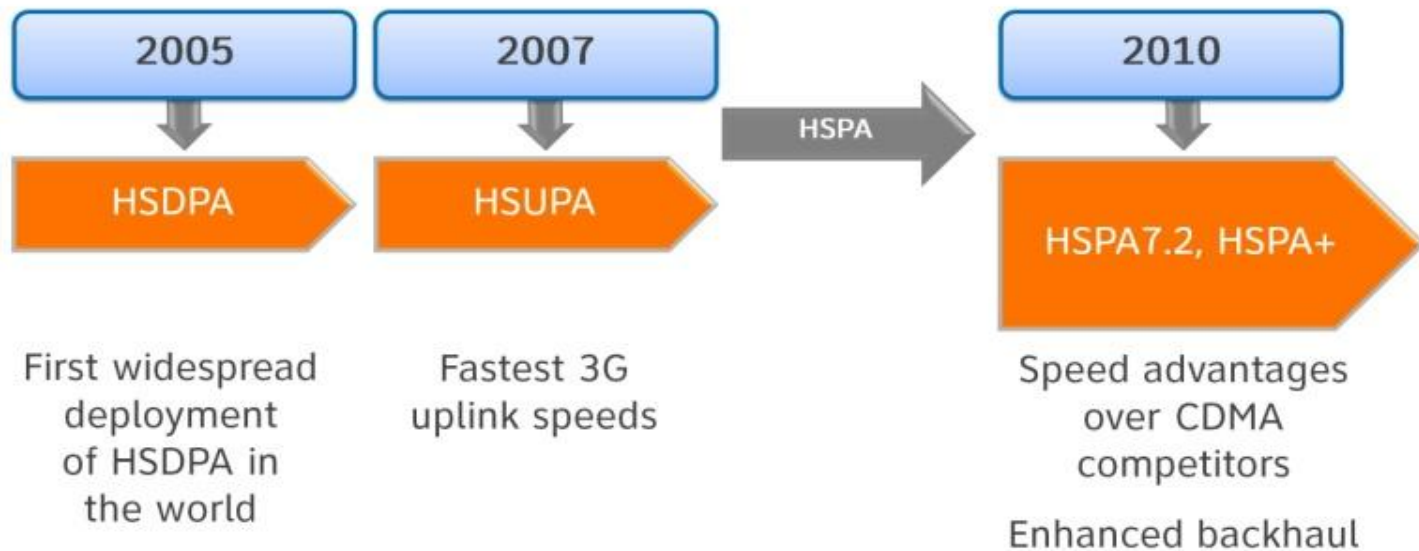
Courtesy Alcatel-Lucent

© 2011 AT&T Intellectual Property. All rights reserved. AT&T, the AT&T logo and all other marks contained herein are trademarks of AT&T Intellectual Property and/or AT&T affiliated companies. All other marks contained herein are the property of their respective owners. Information contained herein is not an offer, commitment, representation or warranty by AT&T and is subject to change. Mention of a specific company or entity is not an endorsement by AT&T.



Where We Were

A Brief History of AT&T's Mobile Broadband Networks



© 2012 AT&T Intellectual Property. All rights reserved. AT&T, the AT&T logo and all other marks contained herein are trademarks of AT&T Intellectual Property and/or AT&T affiliated companies. All other marks contained herein are the property of their respective owners. Information contained herein is not an offer, commitment, representation or warranty by AT&T and is subject to change. Mention of a specific company or entity is not an endorsement by AT&T.



Where We Are Going

4G today with HSPA+, tomorrow with LTE



Software deployed late 2010

Enables 4G speeds when combined with Ethernet or fiber backhaul

Trials in Dallas and Baltimore today

Launch mid-2011; 70 to 75 million POPs by year end

Deployment aligns with widespread availability of LTE devices

*4G speeds delivered by HSPA+ with enhanced backhaul. Will be available in limited areas. Availability increasing with ongoing backhaul deployment. Actual speeds experience will vary and depend on several factors include device, location, capacity, facilities, and other conditions

© 2011 AT&T Intellectual Property. All rights reserved. AT&T, the AT&T logo and all other marks contained herein are trademarks of AT&T Intellectual Property and/or AT&T affiliated companies. All other marks contained herein are the property of their respective owners. Information contained herein is not an offer, commitment, representation or warranty by AT&T and is subject to change. Mention of a specific company or entity is not an endorsement by AT&T.



So What?

E911/Public Safety Implications

- E911 accuracy governed by new FCC framework w/ county-based accuracy
- 3G/4G smartphones have onboard AGPS; greater potential location accuracy if constellation visible
- Smartphones produce much more potentially useful info than just voice; how best to get it to PSAPs/first responders (NG9-1-1)
- Text to 911: Useful? Vendor hype? New PSAP burden?
- Commercial Mobile Alert System (CMAS)
- Public Safety Interoperability
- Others?



So What?

Policy/Operational Challenges

- More data throughput in the LTE world means more data usage; mixed blessing?
- Ongoing public education essential; “expectation gap” large and growing both with general public and government officials
- Can the public safety potential of NG911 be realized quickly, given fiscal realities? Unintended consequences?
- In an app-based world, what are:
 - Carrier roles?
 - PSAP roles?
 - Other governmental roles?
- Calltaker and other PSAP personnel training challenges?
- Reality-based decision-making in partnership with all stakeholders is the key to success
- We look forward to ongoing collaboration

